

**I claim:**

1. A layer jump control device of a high-speed optical drive for controlling the layer jump process of said optical drive, said device comprising:
  - a low-pass filter used to receive a focusing control signal and output
  - 5 low-frequency components of said focusing control signal;
  - a real-time wobble detector connected to said low-pass filter and used to detect and renew the magnitude of wobble in each wobble period and output a peak value and a bottom value of wobble; and
  - an adaptive layer distance balancing calculator connected to said real-time
  - 10 wobble detector and used to determine a layer jump start position and output a layer distance balancing signal.
2. The layer jump control device of high-speed optical drive as claimed in claim 1 further comprising:
  - a pick-up head having a lens and a voice coil motor, said pick-up head
  - 15 driving said voice coil motor to vertically move said lens according to a driving control force;
  - a preamplifier used to produce a focusing error signal;
  - a controller used to receive said focusing error signal and produce said focusing control signal; and
  - 20 a driver used to output said driving control force.
3. The layer jump control device of high-speed optical drive as claimed in claim 1, wherein said layer jump start position is a gradual position of wobble period near said peak value.
4. The layer jump control device of high-speed optical drive as claimed in
- 25 claim 3, wherein said gradual position is three fourths of said peak value.

5. The layer jump control device of high-speed optical drive as claimed in claim 1, wherein said layer jump start position is a gradual position of wobble period near said bottom value.
6. The layer jump control device of high-speed optical drive as claimed in claim 5, wherein said gradual position is three fourths of said bottom value.
7. The layer jump control device of high-speed optical drive as claimed in claim 1, wherein said optical drive is a DVD drive.
8. A layer jump control device of high-speed optical drive for controlling the layer jump process of an optical drive, said device comprising:
- 10 a low-pass filter used to receive a focusing control signal and output low-frequency components of said focusing control signal;
  - a real-time wobble detector connected to said low-pass filter and used to detect and renew the magnitude of wobble in each wobble period and output a peak value and a bottom value of wobble;
  - 15 an adaptive layer distance balancing calculator connected to said real-time wobble detector and used to determine a layer jump start position and output a layer distance balancing signal;
  - a pick-up head having a lens and a voice coil motor, said pick-up head driving said voice coil motor to vertically move said lens according to a driving control force;
  - 20 a preamplifier used to produce a focusing error signal;
  - a controller used to receive said focusing error signal and produce said focusing control signal; and
  - a driver used to output said driving control force.
- 25 9. The layer jump control device of high-speed optical drive as claimed in

claim 8, wherein said layer jump start position is a gradual position of wobble period near said peak value.

10. The layer jump control device of high-speed optical drive as claimed in claim 9, wherein said gradual position is three fourths of said peak value.

5 11. The layer jump control device of high-speed optical drive as claimed in claim 8, wherein said layer jump start position is a gradual position of wobble period near said bottom value.

12. The layer jump control device of high-speed optical drive as claimed in claim 11, wherein said gradual position is three fourths of said bottom value.

10 13. The layer jump control device of high-speed optical drive as claimed in claim 8, wherein said optical drive is a DVD drive.

14. A layer jump control method of a high-speed optical drive, said optical drive comprising a low-pass filter, a real-time wobble detector, an adaptive layer distance balancing calculator, an pick-up head, a preamplifier and a  
15 controller, said method comprising the steps of:

using said real-time wobble detector to continually detect and renew the magnitude of wobble in each wobble period before layer jump and then output a peak value and a bottom value of wobble;

determining whether the magnitude of wobble is larger than a set value when  
20 layer jump begins;

using a layer distance balancing signal to perform a layer jump process;

using the output of said low-pass filter as said layer distance balancing signal if the magnitude of wobble is not larger than said set value; and

using said adaptive layer distance balancing calculator to determine a layer  
25 jump start position and output said layer distance balancing signal if the

magnitude of wobble is larger than said set value.

15. The layer jump control method of a high-speed optical drive as claimed in claim 14, wherein said optical drive is a DVD drive.

16. The layer jump control method of a high-speed optical drive as claimed in  
5 claim 14, wherein said layer jump start position is a gradual position of wobble period near said peak value.

17. The layer jump control method of a high-speed optical drive as claimed in claim 16, wherein said gradual position is three fourths of said peak value.

18. The layer jump control method of a high-speed optical drive as claimed in  
10 claim 14, wherein said layer jump start position is a gradual position of wobble period near said bottom value.

19. The layer jump control method of a high-speed optical drive as claimed in claim 18, wherein said gradual position is three fourths of said bottom value.

20. The layer jump control method of a high-speed optical drive as claimed in  
15 claim 14 further comprising the steps of:

using said controller to receive a focusing error signal produced by said preamplifier to produce a focusing control signal; and  
transmitting said focusing control signal to said low-pass filter.

21. The layer jump control method of a high-speed optical drive as claimed in  
20 claim 14, wherein said layer jump process further comprising the steps of:

producing a kicking process according to a kicking signal and said layer distance balancing signal;

producing a holding process according to said layer distance balancing signal;

25 producing a braking process according to a braking signal and said layer

distance balancing signal; and  
producing a waiting process according to said layer distance balancing  
signal.